5.16.60 INDIRECT TENSILE TEST (Kansas Test Method KT-60)

a. SCOPE

This test method provides procedures used to determine tensile creep compliance in hot mix asphalt. It also provides the data to conduct thermal cracking and fatigue cracking analysis.

Note: Procedure for critical cold temperature selection.
Specification temperature shall be chosen using FHWA LTPPBind software (Version 2.1) using the weather station closest to the project. The required temperature for the specification is the coldest temperature at the top of the CIR layer in the pavement structure. Use 98 percent reliability.

b. REFERENCED DOCUMENTS

b.1. AASHTO TP9-96; Determining the Creep Compliance and Strength of Hot Mix Asphalt (HMA) Using the Indirect Tensile Test Device

c. PROCEDURE

c.1. Perform the indirect tensile testing in accordance with AASHTO TP9-96 (Provisional Standard) with the following exceptions.

c.1.a. TP9 Section 10.2 Specimen Size

c.1.a.1. Specimens using the medium gradation as specified in Section 5.19.04 page 1 Part V of the Construction Manual, shall be 150 mm in diameter and at least 115 mm in height and compacted to air voids +/- 1 percent of design air voids at the design emulsion content. A trial specimen is suggested for this. Test specimens shall be cured at 60^{o}C (140^{o}F) no less than 48 hours and no more than 72 hours. Check specimen mass every 2 hours after 48-hour cure to check with compliance of no more than 0.05% change in mass in 2 hours. After curing, two specimens shall be cut from each compacted specimen to 50mm in height. Perform bulk specific gravity after cutting.

c.1.b. TP9 Section 9.1 Laboratory Molded Specimens and 9.2 Roadway Specimens

c.1.b.1. Instead of three specimens, two specimens are the minimum required at each of three temperatures.

c.1.c. TP9 Section 11.1

c.1.c.1. Select two temperatures at 10^{o}C intervals that bracket the required specification. For example, if the required specification temperature is -25^{0}C, then select testing temperatures of -20^{0}C and -30^{o}C. A temperature of -10^{o}C or -40^{o}C should then be selected to complete the third required temperature.

c.1.d. TP9 Section 12.1 Tensile Strength Testing

c.1.d.1. The tensile strength test shall be carried out on each specimen directly after the tensile creep test at the same temperature as the creep test.

c.1.e. TP9 Section 6.1.4 Environmental Chamber

c.1.e.1. The environmental chamber must be capable of temperatures down to -40°C.

c.1.f. TP9 Section 13 Calculations

c.1.f.1. The critical cracking temperature is defined as the intersection of the calculated pavement thermal stress curve (derived from the creep data) and the tensile strength line (the line connecting the results of the average tensile strength at the two temperatures).